

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte YONG-IN PARK
and
WOONG-KWON KIM

Appeal No. 2004-1965
Application No. 09/855,694

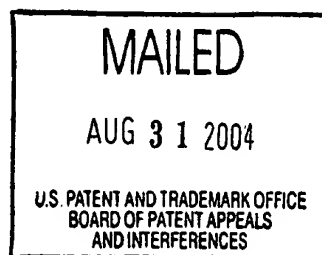
ON BRIEF

Before DELMENDO, JEFFREY T. SMITH, and PAWLIKOWSKI,
Administrative Patent Judges.

DELMENDO, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 (2003) from the examiner's final rejection of claims 1 through 5 and 15 through 20 (final Office action mailed Dec. 4, 2002) in the above-identified application. Claims 6 through 14, which are the only other pending claims, are said to be withdrawn from further consideration. (Appeal brief filed Oct. 3, 2003, page 2; examiner's answer mailed Dec. 30, 2003, page 2.)



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The subject matter on appeal relates to: a method of fabricating a thin film transistor (TFT) (claims 1-5); a method of forming a TFT (claims 15-17); and a method of making a liquid crystal display device having a first substrate and a second substrate (claims 18-20). Further details of this appealed subject matter are recited in representative claim 1 reproduced below:

1. A method of fabricating a thin film transistor, the method comprising:
forming a gate electrode of the thin film transistor on a substrate;
depositing an organic insulating layer over the substrate having the gate electrode;
transferring the substrate to a heating and deposition equipment;
heating the substrate in the equipment under vacuum and curing the organic insulating layer; and
forming a silicon layer on the organic insulating layer in the equipment without breaking the vacuum.

In addition to the admitted prior art, the examiner relies on the following prior art reference as evidence of unpatentability:

Yamazaki et al.	6,261,881 B1	Jul. 17, 2001
(Yamazaki)		(filed Aug. 19, 1999)

Claims 1 through 5 and 15 through 20 on appeal stand rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of the appellants' admitted prior art and Yamazaki. (Answer at 3-6.)

We affirm. Because we are in substantial agreement with the examiner's factual findings and legal conclusions, we adopt them as our own and add the following comments for emphasis.¹

The appellants do not dispute the examiner's determination that the so-called "Related Art" discussed in the specification (page 2, line 11 to page 7, line 22 and Figures 1-4) is available as prior art against the subject matter of the appealed claims. Nor do they dispute the examiner's factual findings (answer at 3-4) regarding this admitted prior art. Rather, the appellants' principal argument in this appeal is that Yamazaki "teaches a method of making a liquid crystal

¹ The appellants submit that the appealed claims should be grouped as follows: "Independent claim 1 and its dependent claims 2-5; Independent claim 15 and its dependent claims 16-17; and Independent claim 18 and its dependent claims 19-20..." (Appeal brief at 4.) We note, however, that "[m]erely pointing out differences in what the claims cover is not an argument as to why the claims are separately patentable." See 37 CFR § 1.192(c)(7)(2003) (effective Apr. 21, 1995). Because: (i) the appellants' arguments with respect to claims 15 and 18 merely amount to "pointing out differences in what the claims cover"; and (ii) the appellants do not explain why claims 15 and 18 are considered to be separately patentable from claim 1, we hold that all the appealed claims stand or fall together. In re McDaniel, 293 F.3d 1379, 1383, 63 USPQ2d 1462, 1465 (Fed. Cir. 2002). ("If the [appeal] brief fails to meet either requirement [as provided under 37 CFR § 1.192(c)(7)], the Board is free to select a single claim from each group of claims subject to a common ground of rejection as representative of all claims in that group and to decide the appeal of that rejection based solely on the selected representative claim.").

display device and thin film transistor that is different from the invention as recited by the present claims" because the interface that Yamazaki "is concerned with is the interface between the second gate insulating layer and the semiconductor layer described in embodiment 3, not the interface between the first gate insulating layer (BCB) and the second insulating layer (SIN_x or SiO₂ [sic])." (Appeal brief at 7 and 8.)

The appellants' position is without merit. The examiner found, and the appellants do not dispute, that the admitted prior art differs from the subject matter of appealed claim 1 only in "transferring the first substrate having the organic layer from a first chamber to a second chamber without exposing the first substrate having the organic layer to oxygen atmosphere during transfer." (Answer at 4.) To account for this difference, the examiner relies on the teachings of Yamazaki.

Yamazaki teaches (column 2, lines 31-38):

When a semiconductor element, for example, a TFT is manufactured using thus contaminated semiconductor film, characteristics of the interface between the active layer, in particular, a channel formation region and the gate insulating film are degraded, causing fluctuation and degradation in electrical characteristics of the TFT. Also, the impurities (boron, oxygen, moisture, sodium, etc.,) inhibit

crystallization of the semiconductor film at the crystallization step.

Thus, Yamazaki discloses a method to improve "the interface between an active layer, in particular, a region for constructing a channel formation region and an insulating film." (Column 2, lines 41-49.) Specifically, Yamazaki teaches (column 3, lines 1-16):

To attain the above objects, the present invention is given one feature, among other features, that a gate insulating film and a semiconductor film are formed without exposing them to the air on a substrate having a gate wiring formed thereon, the semiconductor film is then crystallized by irradiation through a protective film with infrared light or ultraviolet light (laser light) and, thereafter, impurities are doped through the protective film to form a source region and a drain region. This impurity doping is made on the semiconductor film through an insulating film (the protective film) covering thereof. It is preferable to sequentially form the gate insulating film, the semiconductor film and the protective film on the substrate having the gate wiring formed thereon without exposing them to the air. The protective film may be formed by irradiating the semiconductor film with laser light. [Underscoring added.]

It is clear, therefore, that the teachings of Yamazaki would have suggested to one of ordinary skill in the art that the active and protective film layers should be formed over the organic or insulating film (BCB layer) in separate chambers without exposing them to air (i.e., without breaking a vacuum).

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(Column 15, lines 35-43.) To the extent that the method exemplified in Yamazaki includes the formation of unrecited layers, appealed claim 1 does not exclude such additional unrecited layers. In claim drafting, the term "comprising" not only alerts potential infringers that the recited steps are essential, but that other unrecited steps may be included and still form a construct within the scope of the claim. Cf. In re Baxter, 656 F.2d 679, 686, 210 USPQ 795, 802 (CCPA 1981).

Given the combined teachings of the admitted prior art and Yamazaki, we share the examiner's view (answer at 4) that "it would have been obvious to one of ordinary skill in the art...to deposit the organic layer over the first substrate and transfer it from one chamber to another without exposing the organic layer to the atmosphere as taught by Yamazaki et al. in the TFT process of the [admitted] prior art, since this would improve the interface between an active layer and an insulating film..." Here, both the motivation to combine the references and the requisite reasonable expectation of success are founded in the prior art. In re Vaeck, 947 F.2d 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991) (citing In re Dow Chemical Co., 837 F.2d 469, 473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988)).

Relying on the description in the present specification at page 6, lines 1-4 and 9-11, the appellants urge that "Yamazaki fails to address the deficiencies of a silicon nitride (SiNx) gate-insulating layer." (Reply brief filed Mar. 1, 2004, page 2.) According to the appellants (id.), "the embodiments of Yamazaki either fail to teach an organic insulating layer as a true first insulating layer or tellingly include a base layer SiNx before a first insulating film." Appealed claim 1, however, fails to exclude SiNx. Instead, it embraces such a layer.

The appellants' argument that "there is tellingly no discussion of how that BCB layer is formed or even in which chamber such a layer is formed" (reply brief at 2-3) is also unavailing. One of ordinary skill in the art would simply follow the teachings at column 15, lines 14-16 and 35-43. Also, the appellants fail to identify any objective evidence establishing that one of ordinary skill in the art would be subject to any undue experimentation in forming a BCB layer in accordance with the teachings of Yamazaki.

Because the appellants have not rebutted the examiner's prima facie case of obviousness with any persuasive argument or objective evidence (e.g., unexpected results), we affirm the

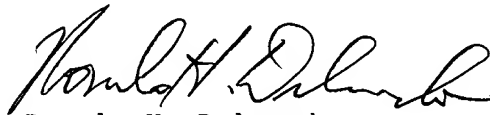
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examiner's rejection under 35 U.S.C. § 103(a) of appealed claims
1 through 5 and 15 through 20 as unpatentable over the
combination of the appellants' admitted prior art and Yamazaki.

The decision of the examiner is affirmed.

No time period for taking any subsequent action in
connection with this appeal may be extended under 37 CFR
§ 1.136(a).

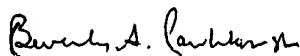
AFFIRMED



Romulo H. Delmendo
Administrative Patent Judge



Jeffrey T. Smith
Administrative Patent Judge



Beverly A. Pawlikowski
Administrative Patent Judge

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